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☆ THIS MONTH ☆

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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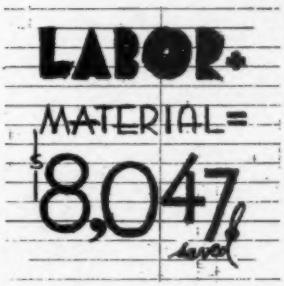

COST CAN BE COUNTED.—September 15 was a red-letter day at the Jackson County farm near Ripley, W. Va.

On that day, a crowd estimated at 12,000 looked on while a working force of 300 men applied a complete face lifting that covered all of the practices recommended for proper land use.

At current labor, material, and fertilizer costs, the bill for the day's work would have been $8,047. But it didn't actually cost anything like that. Equipment dealers donated the machinery. Feed stores and individuals paid for the seed, lime, and fertilizer. The workers donated their services. It was a grand demonstration, not only of what should be done to farm land but of real community effort.

It was a demonstration broken down in such a way that those farm operators who might want to apply some of the improve-

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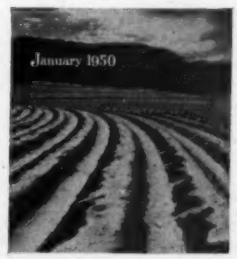

FRONT COVER.—Contour cultivation holds the snow in Bernalillo County, N. Mex. Plowing on the contour prevents flooding and insures equal distribution of water when it rains. Each furrow acts as a dam across the slope, lets the moisture seep in slowly for storage until needed. Photo by E. R. Wellington.

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PASTURE ON DISPLAY

KITTITAS SOIL CONSERVATION DISTRICT
PASTURE & FERTILIZER DEMONSTRATION PLOT
CONDUCTED IN COOPERATION WITH THE USDA SOIL CONSERVATION SERVICE, STATE COLLEGE OF WASHINGTON, KITTITAS COUNTY AGENT AND STATE PROSSER EXPERIMENTAL STATION
FOR DETAILED INFORMATION CALL AT DISTRICT OFFICE 207 NORTH PINE ST.

District Chairman Bob Rutter is mighty proud of this sign and what it represents.

By CARROLL H. DWYER and ARTHUR E. MILLER

R. L. (BOB) RUTTER, State senator in Washington and former vice president of the National Association of Soil Conservation Districts, is given to saying:

"We hear a lot these days about 'group action' and 'grass roots' programs. Here in Kittitas County in central Washington we have practiced group action for many years. As a group we got together and made Ellensburg known throughout the country as the home of the Ellensburg Rodeo, one of the country's 'Big Four.' As a group we organized the Kittitas Soil Conservation District. The district board of supervisors, as a group, sponsored a pasture demonstration which proved that we could produce 650 pounds of beef per acre on pasture."

There is quite a story behind those few words. In 1945 the Soil Conservation Service made a study of a number of pastures in the valley. This study showed rather discouraging results as most of the irrigated pastures were carrying only one-half to one animal unit per acre. The farmers were getting 150 to 200 pounds of beef per acre during the pasture season.

At one of the monthly board meetings Alan Rogers, a board member and now head of the public relations committee of the National Livestock Association, said: "I know from my own experience that good pastures provide the cheapest way of putting meat on cattle. However, I know that farmers in this valley are not getting as much profit from their pastures as they should.

NOTE.—The authors are, respectively, soil conservationist, water conservation division, Soil Conservation Service, Portland, Oreg., and work unit conservationist, Soil Conservation Service, Ellensburg, Wash.

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What we need to know is—what will a good pasture produce, and how much will it cost? We need a good pasture demonstration!"

That started a train of thought. It was found that about a third of the irrigated land in the valley was used for pastures. Most of it was on classes III, IV, or VI land. Too often if land wasn't good for anything else, it was used for pasture. Still, irrigation water for pasture cost as much as water for potatoes or corn. If good pastures were to be established, it was necessary to show the farmers that they were both possible and profitable.

The board decided to sponsor an improved pasture demonstration. It didn't want just some small plots, but a pasture that approximated those used by most of the cooperators. Late in the fall of 1945 it rented a 41-acre tract for 5 years. The land was in pretty sorry shape. About half of it had been used for grain that year and was badly infested with quack grass. A couple of acres were tulle swamp and about 15 acres more were too wet to plow. The field contained about 6 acres of gravel bars. The Soil Conservation Service mapped the field as classes III and IV land.

Bob Rutter says, "We decided to go 'whole hog' and really see if we could grow a good pasture. We requested the Soil Conservation Service, the county agent, and the State College of Washington to help set up a working plan. On the basis of the ensuing suggestions, we decided to install drains, level the land, prepare a good seedbed, and plant a recommended pasture mixture.

"The Soil Conservation Service placed Arthur E. Miller in charge of the technical phases. The SCS also gave us invaluable help in laying out the drains, in land leveling, and in installing the irrigation system. It furnished the pasture seed.

"We decided to divide the pasture into four fields of equal size and to rotate the grazing. Pasture management practices, such as fertilization, clipping, and the spreading of droppings, would be carefully folowed. Particular care would be taken to leave adequate cover for winter protection."

During the spring and summer of 1946 drains were dug and the fields worked 7 to 18 times to kill grass. The fields were leveled, the irrigation system installed, and the pastures seeded. Complete cost records were kept. Total costs of drainage, leveling, land preparation, and seeding added up about like this:

	Cost per acre (dollars)	Total cost (dollars)
Drainage	16.17	633.10
Land leveling	18.72	767.50
Irrigation structures	1.50	61.56
Cross fencing	1.20	49.06
Land preparation, seed, seeding, and ditching	46.51	1,907.22
Total	84.10	3,418.44

The whole pasture was given 300 pounds of 18-percent superphosphate per acre at time of seeding. One-half of each field was given 300 pounds of 18-percent superphosphate per acre in 1947 to study the effects of fertilizer.

In 1947 the pasture seedings came through the winter in good shape. The fields were clipped to get rid of annual weeds. The first crop was cut for hay so that the seeding could become well established. The hay crop amounted to about 66 tons. The pastures were grazed lightly during the latter part of the season. Fifty head of Hereford steers were grazed 4,350 steer-days on the 41 acres. They gained 8,650 pounds, or an average gain of 1.97 per steer per day.

In 1948 the pasture was ready for use 10 days to 2 weeks earlier than other pastures in the valley. Sixty head of yearling grade Hereford steers were turned on it April 23, and 40 head were added a couple weeks later. During the pasture season of April 22 to September 24 (154 days) an average of 79 steers was grazed on the 41 acres. The pasture provided 12,170 steer-days of grazing and produced total gains of 26,530 pounds. The average beef produced per acre was 647 pounds. The average daily gain per steer was 2.18 pounds. The pasture produced an average of 297 steer-days of grazing per acre.

How did these results compare with the native pastures? Relatively good records are available on unimproved native pastures and partially improved and properly managed native pastures. These records (shown in a table) speak for themselves.

The district board of supervisors summarizes the demonstration as follows:

"What has the demonstration pasture meant to the Kittitas Soil Conservation District? We believe that the Ellensburg Valley is in a fair way of becoming well known for two things now—its rodeo and as the home of the best irrigated

Comparison of pasture yields

Item	Unimproved native pasture	Partially improved native pasture	Demonstration pasture
Average steers per acre.....number..	1.1	1.6	2.0
Average daily gains per steer..pounds..	1.5	1.69	2.18
Total gain per acre.....do....	200–250	437	647
Average cost per 100-pound gain dollars..	10.37	7.42	6.47

pastures in the State. The pasture has proved to us, and to the farmers of the valley, that excellent pastures can be grown, and, if properly managed, are one of our most profitable crops. A visit to the pasture has been a 'must' for ranchers and cattlemen from near and far. So far this year the district board has received requests for assistance in establishing pastures 'just like the district's' on over 3,000 acres. This is only a beginning. We like to think of our district board's sponsorship of this demonstration with the cooperation of State and Federal agencies as 'democracy at the grass roots.' "

DISTRICT PROFILE

GARDNER of UTAH

That sandy-haired, unassuming rancher from Utah's "Dixie Land," who for the past 2 years has done such an outstanding job as president of the Utah Soil Conservation Districts Association, is E. S. Gardner of Pine Valley.

"Ras" is a native son. He comes from pioneer stock, his father, Rueben, having been one of the early cattle raisers of southwestern Utah.

After receiving his education at Branch Agricultural College, Cedar City, and Utah State Agricultural College, Logan, Ras went back to the ranch at Pine Valley to help his father with the cattle business. There he became one of the first breeders of pure bred Herefords in southern Utah.

He has remained there ever since and is now one of the most successful raisers of registered Hereford cattle in southwestern Utah. He also has a commercial herd of grade Herefords.

E. S. Gardner.

Besides raising whiteface cattle, Ras operates 120 acres of irrigated cropland and 1,000 acres of pasture and grazing land. This farm is operated in conjunction with his cattle business.

Picturesque Pine Valley has an elevation of 6,400 feet, being situated in the headwaters of Santa Clara Creek. It is bounded on all sides by the Dixie National Forest.

To augment his private range holdings (common practice in the Western States) Ras grazes some of his cattle in the summer on National Forest lands and in the winter on Bureau of Land Management lands. He has owned cattle permits on Federal range since going in the cattle business.

Ras and his wife, Maude, have been married 32 years. They have two girls and one boy. Their son, Dean, served in the armed forces during World War II and is now working with his father on the ranch.

Community service and civic leadership were characteristics of Ras a long time before he became interested in soil conservation districts. He acted as president of the Santa Clara Water Users' Association several years and served 6 years as representative of Washington County in the Utah State Legislature. He is now a member of the Utah Legislative Council.

Ras has been an ardent church man all of his life, a member of the Church of Jesus Christ of Latter Day Saints. He has held many positions in the church and served as ward bishop of the Pine Valley ward 13 years.

The soil conservation district act was passed by the Utah State Legislature in 1937. The Lower Virgin-Santa Clara District was organized in 1938 and received its certificate of organization in January 1939. Gardner was instrumental in organizing this district and was elected as a supervisor on the district's first board. Since then he has been reelected twice and has served his community as a supervisor 10 years.

While in the Utah State Legislature during the early days of conservation in Utah, he took an active part in formulating necessary legislation to further the district program.

He also appeared before the agricultural committee of the United States House of Representatives to outline his views and the desires of his organization for constructive soil conservation legislation.

Ras is a firm believer in the district movement and never misses a chance to emphasize the importance of keeping the control of the soil and moisture conservation program in the hands of local farmers and ranchers.

He has been very active in preaching the various aspects of the complete conservation program to his neighbors and to all with whom he comes in contact. Not only does he preach but he also practices what he preaches.

In February 1948 at the annual meeting of soil conservation district supervisors, Ras was elected president of the State organization. Under his leadership, the State association was formally organized. Representatives from the various sections of the State were elected and articles of association were drawn up and adopted. Under his guidance this organization has a position of prominence in State affairs.

Ras is a very busy man. In addition to his conservation activities, he is vice president of the Utah Cattle and Horse Growers' Association and has the distinction of representing his section of the United States as a member of the executive committee of the American Livestock Association. He is also a director in the Bank of St. George. It takes a busy man to get things done, and done right.

—A. J. WEBBER.

HIGH-VELOCITY OUTLET CHANNELS

By H. G. BOBST

SAFE TRANSPORTATION of water in natural or man-made channels is a major engineering problem. It requires maintenance of a velocity that permits neither scouring of bottom or banks of the channel nor deposition of silt. The problem is the same whether the channel is a major stream or an outlet carrying water from a terrace system, for the same basic laws of hydrology apply.

The problem resolves itself into one of providing disposal channels for surplus water from farms at a cost that farmers can afford. Mostly, this is accomplished by designing channels that can be protected adequately by grass. But there are places where grass alone has not been enough because the slope is too steep, the soil too low in fertility, the quantity of water too large, or a combination of these and other factors.

Ten years' observation of three concrete, high-velocity channels in terrace outlets, or grassed waterways, in Nebraska indicate that they offer a satisfactory solution to this situation. They have the advantage over the more conventional drop systems of being within the farmer's ability to finance. They are less susceptible to weather and rodent damage, and they need to be large enough to handle only part of the flow in the outlet.

My first acquaintance with the failure of grass to give adequate protection to grassed outlet channels came when I was project manager of the Box Elder demonstration project in Douglas County, Nebr., from 1935 to 1937.

Observation of a number of waterways convinced me that it was not the large discharge of water down the channels that caused most of the trouble. Instead, it appeared that small, continuous flows lasting days or weeks were principally responsible. These first killed the grass; then, as later rains caused flows, the water cut gullies where the grass had been destroyed.

A need was indicated for some method of taking care of a small part of the total expected discharge in a protected channel without setting up undue turbulence. It was also evident that if this could

NOTE.—The author is assistant State conservationist, Soil Conservation Service, Salina, Kans.

be done, grass could be expected to protect the rest of the outlet, even on steeper slopes than was then considered possible.

Three concrete high-velocity channels were built to try out this theory. Two were built by CCC camps in 1939 while I was in charge of CCC-SCS work in the Northern Great Plains. One is on the John Rakosnik farm near Pawnee City, Nebr., and the other on a farm 2 miles west of Franklin, Nebr. The third, on the Harold Shackleton farm near Pawnee City, was built in 1943 by a camp at Weeping Water.

The waterway on the Rakosnik farm replaced an active gully on a slope leading to a creek with high, precipitous banks. Built on a 7.24-percent slope, the upper end of the channel is at the lower end of a terrace outlet and extends down to the flow line of the creek. The channel is of concrete, V-shaped, 225 feet long, 1 foot deep and with an over-all width of 4 feet, and located exactly in the middle of the waterway.

Shaped to a 5-pecent slope from either edge to the channel, the whole waterway's cross section is a flat V with the high-velocity channel in the center. The channel was formed in 20-foot sections, with hog wire for reinforcing and a concrete slab 4 inches thick. A cut-off was provided for each section and standard expansion joint material was used. The waterway was sodded with bluegrass.

A total of 31 acres, with the cropland terraced, drains into this waterway. Total maximum discharge was calculated to be 82 cubic feet per second, and the high-velocity channel was planned to handle 32 cubic feet per second, or 40 percent of the maximum expected discharge.

An examination this spring showed that no erosion has occurred along the whole length of the channel, although the waterway has been heavily grazed and water has flowed over the grass section of the waterway as well as in the channel high-velocity section. This structure has had no maintenance since it was built.

The cross section of both the high-velocity channel and grassed waterway near Franklin, Nebr., are the same as Rakosnik's, but it has a variable grade. The upper part has a 6-percent grade, breaks off sharply to a 10-percent slope, then flattens out to 6 percent at the lower end. The waterway was sodded with western wheatgrass.

That waterway is a field-side outlet along the property line, designed to take the water from the terraces on two farms. One farm was never terraced, however, so the waterway has never had over 15 acres of drainage.

Two views of the waterway and high-velocity channel on the John Rakosnik farm near Pawnee City, Nebr., in the Turkey Creek Soil Conservation District. The 1939 view is of the gully caused by runoff from the land above; the lower picture tells how it looks today. The waterway has been heavily grazed without sign of damage, although it has had no maintenance.

After 10 years, this channel is in excellent condition, and the western wheatgrass has shingled down over the edge so that the channel is almost obscured from view. Although not subject to very heavy flows, it has demonstrated stability under freezing and thawing conditions, and there has been no rodent damage.

The channel built on the Shackleton farm near Pawnee City has a trapezoidal cross section 1 foot deep, 9 inches wide at the bottom, and with one-

to-one side slopes. The concrete is 4 inches thick. It is 118 feet long, and expansion joints and collars are provided for each 20-foot section. The cross section of the waterway is the same as the others. Slough grass was started adjacent to the concrete channel, and bromegrass on the rest of the waterway.

This channel differs from the others in that it is the lower end of the spillway of a farm pond. The drainage area is 52 acres, of which 40 are terraced and 14 are pasture. Computed for a 15-year frequency, the maximum discharge to be expected was calculated to be 150 cubic feet per second. The concrete channel's capacity is 36 cubic feet per second, or 24 percent of the maximum discharge expected.

Because of exceptional cooperation by the farmer, more information has been obtained from this channel than from the others. In 1947, for example, Shackleton, after a heavy rain, couldn't cross the spillway at the end of the dam without the water topping his knee boots—about 2 feet deep, he estimated. Yet, he found that down from about 20 feet below the upper end of concrete channel all the flow was contained in the structure.

Besides being cheaper, these structures are superior to drop structures for this purpose, in my opinion. Drop structures let water down in vertical steps, and must be carefully designed and built. Further, they must be large enough to take the maximum expected discharge because overtopping will create turbulance and cause them to fail. And in addition, they are susceptible to damage from frost action and burrowing rodents.

No one knows, of course, whether the maximum expected discharge from the areas above these channels has ever occurred, but there have been numerous violent storms. During the years that the channels have been in place they have stood up with little maintenance, if any, under changing climatic conditions and have not suffered rodent damage. They have withstood trampling by livestock. And they have handled the trickle flows, thereby protecting the rest of the waterway so that the grass can be kept thrifty for the time when the flood flow overtops the concrete channel.

The cost of these channels was relatively high because the work was done by hand. It is conceivable, though, that small contractors can equip themselves with shapers and forms and build such channels at a cost well within the reach of the farmers. The years of observation have also convinced me that a channel of this type may have a capacity as low as 15 percent of the maximum expected discharge and still give adequate protection.

High-velocity channels are not intended to substitute for grass. There is an old adage among construction men: "Never send tracks where wheels will go." Paraphrased for the Soil Conservation Service, it would be: "Never use concrete where grass will do." But when we do have a place where grass will not do, we need a practical, long-life structure that will stand up under the conditions on an average farm. These channels give promise of filling the bill.

PEOPLE WORKING TOGETHER

By HUGH BENNETT

PEOPLE normally do things together and live in close contact with one another. This we have known all along, but in soil conservation we had made little use of the potentialities involved with this human characteristic until the advent of the soil conservation districts.

People live together in villages and cities; and we take it for granted they like to live that way and let it go at that, with little thought of the complications and forces involved with such gregarious ways of life. In urban areas people join one another in countless activities relating to their general welfare. They help one another in the maintenance of streets, water supply, fire protection, police protection. They build public hospitals, operate schools, and maintain libraries, parks, and zoos for the benefit of all. In some countries great walls have been built around cities as a means of protection from banditry and invasion.

These joint actions appear to conform to the natural behavior of humans, like bees, ants, and wasps living together, working together, defending their home places together, and accomplishing much more than on an individual basis.

Similarly, people do many things together in rural areas more or less for the same general purposes. In communities they join one another in the operation of schools and churches; they

The American way: Farmers vote on proposed creation of new soil conservation district, Johnson County Courthouse, Ga.

sign joint petitions for help in the building and maintenance of roads and schoolhouses and in procuring the services of school buses and highway patrolmen. In other words, they help one another by working together.

Here again the guiding force is of the natural order. There is even less evidence of force through man-made laws on farms than in cities. That is to say, there is less artificiality and more naturalness in the ways of farm life.

In rural areas we find group action of a still another environmental pattern. The activities of people working together in more or less compact rural areas takes the form of an even greater naturalness than in cities, approaching almost instinctive action. I have reference to relatively small groups of neighbors, whose members often are unaware of the neighborliness enjoyed in their mode of living. They work together in ways that they themselves do not always realize. They have their leaders, for example—leaders who are neither appointed nor elected. These are simply locally outstanding men who have won the confidence of their neighbors and to whom their neighbors turn for advice with respect to both their individual and mutual interests.

A variety of neighborly forces bind these small groups together. Sometimes church interests serve as the catalytic agent, or the school, or other kinds of meetings among themselves. Picnics and baseball games are examples of the neighborliness sometimes met with in these neighborhoods. Probably common needs, especially in the form of emergencies, bring the members of such groups closer together than all other influences—emergencies like sickness, fires, floods, drought, livestock epidemics. Often they come together to help one another slaughter, dip cattle, or round up livestock. Old-fashioned quilting parties passed out years ago, as did corn huskings and "log rollings." Plowing contests today are giving way to "farm face liftings," and terracing matches (the latter, however, are more characteristic of larger groups, as community groups and large artificial groups like soil-conservation districts).

What is of greatest importance to conservationists is the fact that these groups, small and large, can be located, their members and leaders identified, and their demonstrated willingness to work together advantageously utilized through joint action in the furtherance of soil and water conservation. This last fact accounts for our latest method of speeding up soil conservation. At this time the Soil Conservation Service is cooperating with probably 30,000 of these neighbor groups—and with much success. We are having varied ex-

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periences in working with these small neighbor groups, but in the great majority of cases we are getting along admirably with the method.

Recently in Michigan, I asked a farmer, after looking over the soil conservation work on his farm which had attracted some considerable attention throughout the local soil conservation district, if the other farmers of the neighborhood had taken up any of the kind of work he had carried out. His reply was that very little had been done locally. "Farmers around here," he said, "stand back and watch the work of others until they have made up their own minds as to whether or not they like it and want it."

Then I asked him if there might not be a possibility of the others of the neighborhood getting together and discussing conservation matters with the view of helping one another push ahead with the work or of gradually developing such an inclination.

"No," he replied, "we'll just have to wait for them to make up their minds themselves. The farmer over there across the road refuses to work with the local soil conservation district or with the technicians of the Service. He's a good man, too; just inclined for reasons of his own to lay hands off anything the Government proposes."

"Do you have anywhere around here," I then inquired, "anything on the order of a neighborhood group?"

"I am afraid not; but they have them south of here," he said.

"No picnicking, no getting together to discuss school or church matters, nothing of that kind?"

"No."

"Don't you have something of the old-fashioned neighborhood spirit and action among the people hereabouts?"

"No, sir; there is nothing of that kind here any more. Part of our children go to the consolidated school to the north of here, by bus; the others go to another school south of here. We just leave school matters entirely in the hands of our school authorities."

"You said your neighbor across the road is a good man; why do you feel that way about him?"

"That fellow—why he would lend me any of his farm machinery if he found out I was in a tight place here on my own farm! Sure, he's a good man."

I made no further inquiry. I was not there to locate a neighbor group but to inspect oil conservation work. I was convinced, however, by this last remark, that I had been talking to a member of a more or less typical neighbor group of the kind that had not yet come to recognize its own existence. When a farmer is willing to help his neighbor in a pinch with his farm machinery, most likely he would help him also in case of sickness, or fire, or any other similar neighborhood matter. And, further, I am convinced that other farmers of the same neighborhood would likewise cooperate with one another in matters affecting the group's welfare. However, even two farmers can help one another in the kind of small group action I have in mind. Some of the groups we are currently working with include only two or three farmers.

Later, in Indiana, I saw a number of groups in action, small and large, and talked with some of them about their progress in soil conservation. I think you get a better understanding of local problems and how they can best be handled when you confer with groups of farmers. That way you get more into the details of what the farmers really think.

Everybody I talked with seemed to like the group approach for getting soil conservation on the land in time.

Perhaps the most outstanding thing I ran into in the State was a little roadside conference we had with some 10 or 15 farmers who by prearrangement had gathered in an area which had been markedly improved by drainage. This was along the Dismal Ditch, in Tippecanoe County. That little gathering struck me as an ideal sort of get-together for discussing soil conservation work. It differed from somewhat similar gatherings in that a place was selected where you could see what had been done and talk about it more understandingly.

There were soil conservation district supervisors and farmers working as a community group in a soil conservation district. Another unusual feature was that a banker was present. One of the points discussed had to do with the fact that these people had first employed a lawyer to help them develop legal ways and means for making assessments and paying for the drainage work. It seemed that about all they had ever derived from their efforts with the law was an occasional bill from their lawyer—which usually amounted to around $300. Disgusted with their failure to get anywhere, the group sent one of its members to the courthouse at LaFayette to find out how they

could detach themselves from the entanglements they had gotten into by what they had done. In other words, they wanted the drainage proposal turned back to themselves. As I recall, it cost $5 to get out the clutches of man-made law.

The next step on their part was to visit all the 52 farmers within the area who would in any way benefit by the drainage, asking those who were willing to sign their names to a sort of gentlemen's agreement to pay what they could and should. This worked out very well, we were told, except that later on a few changed their minds in some measure with respect to final payments.

Following this, the drainage work was carried out with the assistance of the technicians of the Soil Conservation Service. At the time we were there, the job had been pretty well completed and some 2,500 acres had been benefited. The main crop, corn, was looking about as good as corn ever looks anywhere, it seemed to me. I recall asking one of the farmers how the drainage had benefited him. His reply was something like this:

"See that corn over there by the piles of willow brush? When do you think I made my last crop on that land?"

I ask when.

"It was in 1936."

He added that the land had been so wet all the intervening years, he couldn't get it planted in time or couldn't work it adequately, "and so, the willow trees grew up and had to be cut down, piled, and the land planted to corn."

The corn was looking like 100 bushels to the acre, maybe better. Then someone asked the banker what he thought about such an operation. His reply was something like this:

"At our bank in LaFayette, we think so well of this kind of work that we have set aside several thousand dollars for loans to farmers who will show us an agreement with the soil conservation district to carry on such work, provided he has a plan with the district made by the technicians of the Soil Conservation Service. We ask for no further endorsement than the operator's signature and no collateral. We charge no interest until the day the money is taken out of the bank to pay for operations."

Good banking sense, I think.

I was much interested in going over the farm of E. E. Cox, near Crawfordsville, Ind., operated jointly by himself and his tenant, Glenn Myers. They were operating on what they called a 50–50 basis. They divided the costs—all costs, even including taxes—and apparently were thoroughly pleased by the way things were going. It was not difficult to see that they had greatly benefited from the soil conservation work our technicians had helped them carry out through their local soil conservation district.

The landlord said: "I wouldn't farm under any other system but this conservation system we've been following."

Some of the results of conservation they gave us were as follows: The 3-year average per-acre yield of corn before starting the soil conservation program was 26 bushels. The farm at that time was able to carry 8 to 10 cows on its 240 acres. One of the principal fields—the barn field—after the conservation work had taken hold, produced 115 bushels of corn per acre last year and 123 bushels the year before. This field was strip-cropped, cultivated on the contour, and farmed under a rotation of alfalfa mixed with grass, with corn coming in about every 4 years.

The farm is now running close to 100 head of Guernsey cattle for milk production. "Formerly there were 2 or 3 brood sows and they ate pretty much the total production of the farm. There are now 30 brood sows to take care of the increased production of corn," Mr. Cox told us. "There were bad washes in some of the fields when I came out here 13 years ago. You couldn't get across them with a tractor. Now the gullies are gone, all of them, and in their place we are producing corn, alfalfa, grass, milk, and pork. We run 200 to 400 head of hogs most of the time, averaging around 300."

I asked landlord and tenant how they liked the conservation work that had been done on their farm. The landlord said: "I think this is the only kind of farming for a farmer to do. Right now the papers and radio are talking about going more into grass, legumes, and livestock. We are about 5 years ahead of this advice. At first I felt that if we had to farm by terracing and contouring, I would give someone a deed to the place, but I haven't given the place away yet, although some time ago a fellow offered me what he thought was a fancy price for this barn-field part of the farm. The price wasn't up to what I thought the tract was worth. "You know," Mr. Cox said, "tenant farmers who move every year looking for a better place to farm would be better off if they would just

(Continued on page 141)

McLaurin and Zachary contemplate the alfalfa planted as part of the conservation plan for Zachary's Ashe County N. C., farm.

By J. W. ZACHARY

I WAS ready to quit farming and go back to the coal mines 3 years ago. But about that time things started happening that make me glad I didn't.

When I left the Army in September 1946, I was all pepped up over the prospects of becoming a farmer. I had visited the farm a few times in my life, but I had no idea then what was in store for me.

It wasn't long after we got settled down until the long winter feeding of livestock began. That was when I almost went back to digging coal. There were corn and hay on the place, but we had to buy most of the feed used that winter. I decided then and there if I continued to farm I'd have enough feed for my livestock without having to buy it.

I would have gone back to the mines if Jim McLaurin of the SCS hadn't paid me a visit and given me some encouragement. I knew nothing whatever about planning or operating a farm. I didn't even know how to put the harness on a horse. When I asked my neighbors for advice, some of them would laugh at me and some even went so far as to say I'd never make a farmer.

When McLaurin and I went over the farm together, I began to see it all in a different light. Some things I already knew about some of the fields would fit in with what he told me. Other facts he pointed out to me on the map he seemed to apply to each field as we came to it.

"This field is better suited for crops and that one for pasture," he would say. Or, "This field will grow alfalfa with the proper treatment, and that field is too wet for alfalfa but will grow Ladino clover."

After a round of the whole farm, field by field, we figured up the amount of land I would need for crops and pasture and compared it with the totals we had from each field. It was just what I wanted.

NOTE.—The author is a Grassy Creek farmer of Ashe County, N. C., in the New River Soil Conservation District.

My application for training in the Veterans' Farm Program was accepted, and I began to receive instruction in January 1948. The vocational agriculture teachers have helped me very much. One of them visits me about every 2 weeks and helps on almost any problem I have at the time.

These teachers tell when and how to plant certain crops, how to cultivate, and the best time to harvest. Such things may not seem important to one who has spent a lifetime on a farm, but to a person not familiar with farming they are of first priority.

I'm now growing all the feed I need for my livestock with the exception of some protein supplement for dairy cows. Last year I filled a 32-ton silo with corn grown on 1 acre of bottom land. Grown in contour strips on the hill, it made better than 70 bushels to the acre.

This year, I have given 1 acre of corn special attention in an attempt to produce 200 bushels on it. I may not make that much, but I won't lose any money. Several people have estimated that I'll get well over 150 bushels on the acre.

One thing I'm sure of, and that is that I'll have enough grain, hay, and silage to feed all my livestock this winter.

I may never make a million dollars farming, but I'll get more than a million dollars' worth of satisfaction from trying.

GAS UNDER CONTROL.—By action of the Steuben County, N. Y., board of supervisors, a gas lease on county reforested lands has been granted with the provision that no well may be drilled without permission of the Steuben Soil Conservation District officials. Like action has been taken in adjoining Allegany County. This means that drilling operations must conform to soil conservation farm plans. It will prevent cutting up of the area with lease roads, and spoiling of the plantings, ponds, and other conservation measures installed under conservation farm plans. All leases in the two counties now carry this clause.

This is better than a coal mine, thinks J. W. Zachary (at right), as he and Jim McLaurin look out over the Grassy Creek land which he farms as a cooperator with the New River Soil Conservation District.

WILDLIFE MANAGEMENT THROUGH DISTRICTS IN NEW YORK

By BEN O. BRADLEY

THE late Aldo Leopole of Wisconsin—a forester by training—defined game management as the art of making land produce sustained annual crops of wild game for recreational use. The difficulty is that game is usually a secondary crop of the land, particularly on privately owned lands. And with the exception of our big game species, it is here that the bulk of our wildlife is found.

Obviously any proposal for game management on privately owned land must fit into the general management plan of that land. Otherwise, there will be no widespread acceptance of the measures by the owner. Actually, the requirements of food and cover for farm and wood-lot game can be met on most lands by ordinary farming practices. Good soil fertility and good crops are usually favorable to wildlife. Therefore, a program that is designed to maintain and improve the land for agriculture and forestry can be considered—with minor modifications—management for wildlife.

The task of the game manager is to foster the practices which should be encouraged. How to get them on the land for the benefit of the public has long been a stumbling block.

In New York, as well as other States, the opportunity of working with soil conservation districts to advance game management seems to offer much promise. The fact that these districts are set up to prepare complete farm conservation plans to assure the most desirable use of each acre makes a firm base from which to start. The game man can select those practices which will benefit wildlife and seek to get them applied.

Under New York conditions several recognized farm practices benefit wildlife by providing more food and cover. Foresters for years have encouraged landowners to plant trees. The Soil Conservation Service technicians find that nearly every farm has acreage that should be planted to trees. They provide a future timber and wood supply to the owner and also furnish winter shelter to many species of wildlife. That is important in many parts of New York that are deficient in evergreens. Fencing of wood lots against grazing is considered important by foresters in managing the trees for best timber production. This practice is beneficial to wildlife in providing more ground cover for food and shelter. Hedges planted as living fences to control livestock are used by wildlife for food and travel lanes. Woods borders of shrubs recommended to protect trees in the wood lot are important sources of wildlife food and cover. Odd acres on the farm, not suitable for crops or pasture, such as pot holes, rock piles, or swales can be fenced or planted and improved for wildlife. Small marshes may be improved to produce muskrats—a cash crop for the farm family—and at the same time furnish breeding and resting sites for waterfowl as well as other species of game. All these things are important, but many of them are not practiced by the average farmer.

To lessen the lag between planning for the soil conservation measures mentioned and their application, the State Conservation Department through its Division of Fish and Game has launched an assistance program with soil conservation districts. Funds for the work are derived from a Federal Excise Tax on sporting arms and ammunition and made available under the Pittman-Robertson Act passed by Congress in 1937.

Working through its eight district game managers the Pittman-Robertson project uses funds for labor and material to assist in furthering the application of nine practices recognized by the Soil Conservation Service and the New York Conservation Department as important for soil conservation purposes and of known benefit to wildlife. The practices include:

1. Woodland and wildlife area protection.
2. Wildlife area improvement.
3. Wildlife borders.
4. Farm ponds.
5. Tree planting.
6. Windbreak planting.
7. Hedges.

NOTE.—The author is supervisor, wildlife restoration, New York Conservation Department, Syracuse, N. Y.

8. Marsh management.
9. Stream-bank and shore-erosion control.

In setting up the project with the more than 30 soil conservation districts of the State, a memorandum of understanding was prepared and signed defining the duties and responsibilities of each party. The degree of assistance in any one year was left flexible and will be determined as response to the program warrants. For 1949 the cost to the farmer for tree and shrub planting was $7.50 per thousand. Conifer stock is furnished free of charge by the Conservation Department to qualified owners who are cooperating with the department's forest-management program. Shrubs are a free contribution from the Division of Fish and Game and the Pittman-Robertson fund.

Not all owners want their trees and shrubs planted. Some desire supervision only. This is provided or help is obtained from youth groups and sportsmen's clubs to assist with the planting work.

To get woodlands fenced against grazing there are several choices. A crew will do the job for the owner if he furnishes suitable posts and wire and pays 25 cents per rod toward labor costs. Or, as is often the case, the farmer may desire to build his own fences. He may receive either posts or wire for the purpose. With marsh development for muskrat and waterfowl production, owners with suitable sites are encouraged to a considerable degree. The Soil Conservation Service technicians prepare necessary engineering plans for dike construction. The Pittman-Robertson project will contribute one-half the cost of construction (if the job is small) but not to exceed $10 per marsh acre or a total of $100 per marsh unit. Shrub plantings of various kinds (hedges, woods borders, or wildlife areas) are usually made at the same rate applying with evergreen trees—$7.50 per thousand.

As now established and after one season of operation the plan seems to have much merit as a means of spurring the application of several worth while conservation measures on the farm. A total of 5,483,780 trees and shrubs were either planted, supervised, or furnished to soil conservation district cooperators this past spring. Nearly a thousand farms were involved. An estimated total of more than 30,000 rods of fence has been built directly or by landowners, using materials provided by the project. Several hundred acres will be developed into valuable muskrat marshes during the course of the year. All these things, taken together, mean a definite step in the direction of sound, worth while, private-land game management. True, it will take years before the cumulative effect is felt in increased game populations. In fact, there will always be ups and downs among the various species as unfavorable factors take effect. But the basic requirements are being met. The effects of intensive agriculture and the destruction of wildlife habitat are being checked. This seems the only sound way to encourage a farm crop that, unlike others, is enjoyed and harvested by a cross section of all the people—farmers and city people alike. And it is a splendid example of inter-agency cooperation to get a job done. What could be more appropriate than to have a sportsmen's fund directed to help farmers maintain and improve this mutually desirable resource and thus continue the sport of hunting in the American tradition?

POLICING THE TOPSOIL.—It is now possible for Massachusetts cities and towns to prohibit or regulate the removal of topsoil. The General Laws have been amended by adding this paragraph:

"(17) For prohibiting or regulating the removal of soil, loam, sand, or gravel from land not in public use in the whole or in specified districts of the town."

The amendment, now in effect, makes it possible for cities and towns to protect their land from wholesale exploitation. Wholesale removal, explains A. B. Beaumont, State conservationist, has become an acute problem in some towns, particularly in the eastern part of the State where large quantities of loam are used for landscaping purposes.

On the campus at the University of Massachusetts, official action announced in the Executive Bulletin says:

"The construction program on the campus sometimes creates surplus quantities of topsoil. This is a valuable property and its use needs to be assured for the best interest of the university."

ONE THINGS LEADS TO ANOTHER.—Sound farm wood-lot practices, introduced by SCS in southern Jersey's Camburton, Southeast Jersey, and South Jersey Soil Conservation Districts, have been important factors in advancing good land use and in obtaining farmer acceptance of complete conservation farm plans.

"Complete farm plans in Salem County were made on many old farms only after the owners had completed successful timber sales at a good price," says Glenn E. Smith, SCS forestry specialist, after 5 years' work in the field. "Their owners have brought in other farmers."

LESS STREAM-BANK EROSION—MORE PHEASANTS AND QUAIL

By A. J. WEBBER

Stream-bank erosion was a problem on the farm of E. R. Frei, 2 miles southeast of Santa Clara. Black willow post cuttings were planted in the stream bed and along the embankment behind cabled cottonwood trees.

CONTROLLING stream-bank erosion and increasing feed and cover for wildlife through the use of dual-purpose tree and shrub plantings is becoming a recognized practice in soil conservation districts in southern Utah.

Stream-bank protection in soil conservation districts in Washington County, Utah, was first undertaken in 1939. Since then approximately 45,000 linear feet of tree and cable revetments have been installed in a structural control for protection of valuable irrigated farm lands. However, this type of installation provides only a partial solution to bank protection problems and must be accompanied by the planting of willows and shrubs in the silted area behind the revetment in order to make a permanent living protection.

In addition to the use of tree and cable revetments, various types of log and rail tetrahedrons, jetties, willow mats, and other materials have been used as mechanical means of slowing down flood water and causing the silt-laden streams to build up a bar behind the revetment.

These silt bars which vary in width from a few feet to several hundred feet, depending on conditions, must be planted to some type of vegetation which will stabilize the bar and protect it

NOTE.—The author is district conservationist, Soil Conservation Service, St. George, Utah.

from further cutting action. Trees and shrubs having a dense mat of roots are usually most suitable.

The primary purpose of all channel-stabilization plantings is to provide permanent, low-cost erosion control. Our experience is that mechanical controls and vegetative plantings must be used together to be effective.

Stream-bank plantings should not only prevent erosion from cutting banks, but also should include sufficient plantings from the edge of the stream bank to high ground to slow flood flows and prevent the formation of new channels behind the mechanical protection.

Stream-bank plantings along the Virgin River and Santa Clara, LaVerkin, and North Creeks in Washington County, Utah, have consisted largely of Russian-olive, rose, black-locust, squawbush, and black-willow cuttings. These dual-purpose species protect actively eroding stream banks and provide cover and feed for wildlife in one operation.

These plantings provide excellent habitats for game birds, such as pheasants and quail. Ideal sites were established on silt fans in stream beds, ox bows, waste areas between crop boundaries and streams, and other suitable areas.

Every pheasant and quail hunter knows enough to look for birds along field boundaries and stream channels grown up with trees and shrubs. Many farmers, however, believe that these areas also harbor harmful insects and are a source of weed-seed infection and, as a result, prefer "clean" farming. The type of protection and feed along stream banks that is desirable, from a wildlife and erosion-control standpoint, however, is not an unattended growth of volunteer vegetation, but a well-planned and managed stand of species.

A typical example can be found on the farm of George Graff, 8 miles southeast of Santa Clara. Plantings were made along the Santa Clara Creek in cooperation with the Lower Virgin-Santa Clara Soil Conservation District.

The plantings were made in 1940 in connection with the installation of tree-and-cable stream-bank revetment works along an active cutting bank

Here's how the erosion was checked by growing trees.

and on a huge ox bow in a bend in the stream.

The plantings have been protected from grazing by livestock and are doing a very good job of guarding valuable irrigated lands from further damage by flood flows. They also furnish food and cover for pheasants, quail, and other wildlife.

In stream-bank protection work, wildlife management and erosion control are complementary activities.

If plans include adequate provision for a better wildlife environment, substantial returns may be expected. To neglect the intelligent use of border lands is to overlook a great opportunity for encouraging the presence on the farm of valuable birds and animals.

SAND LOVEGRASS MAKES A COME-BACK

By M. D. ATKINS and A. J. LONGLEY

SAND LOVEGRASS, *Eragrostis trichodes*, a native of the sandy lands in much of the Great Plains, where it became almost extinct 10 years ago, is making a remarkable come-back in Kansas. This is important from both the conservation and the grazing standpoints, since sand lovegrass is about the best plant we know for erosion control on hundreds of thousands of acres of sand-hill lands in Kansas and Nebraska that are low in fertility and now produce little forage of value for grazing. It is also an example of how soil conservation districts, farmers, and SCS personnel work together to do in a relatively few years something that would take Nature generations to accomplish, if ever.

The near extinction of sand lovegrass in this area resulted from a combination of factors. A tall-growing, perennial bunchgrass, it was an important part of the native composition on these sand-hill range lands that included sandhill bluestem, little bluestem, side-oats grama, blue grama, and several lesser species. But its soft leafy growth was relished by livestock above all others. As grazing on these lands became heavier, due to a rise in livestock numbers and plowing of other grassland, sand lovegrass was utilized most severely. Then came a history-making drought and the plant disappeared from many sand-hill pastures in the State.

Other desirable species were reduced in the most severely damaged pastures, but none became so nearly extinct as sand lovegrass. Sagebrush, sand paspalum, sand dropseed, and weedy forbs and grasses are the principal vegetation in much of the Kansas sand-hill land. A few ranches in southwest Kansas, where cattle numbers were reduced in time, and a considerably larger area in south central Kansas still support fair stands of gramas, bluestems, and switch grass. But to find the tasty sand lovegrass in this area, it is usually necessary to examine the roadsides outside the pasture fence or pastures that have had little or no grazing the last few years.

This field—15 acres of loose, sandy soil that was low in fertility—yielded a sand lovegrass seed crop the first year. It is on the Harry Lightner farm near Garden City, Kans.

Sand lovegrass started its come-back when a few pounds of seed were obtained by the Soil Conservation Service from collections in Oklahoma. This seed was planted in 1939 on a trial basis with other native warm-season grasses on the Morton County Land Utilization Project at Elkhart, Kans., where more than 70,000 acres of federally owned land needed reseeding. More than 40,000 acres of this is loose sand or sand-hill land bordering the Cimarron River. Sand lovegrass and

NOTE.—The authors are observational nurseryman, Soil Conservation Service, Manhattan, Kans., and district conservationist, Soil Conservation Service, Garden City, Kans.

sandhill bluestem proved to be two of the best species for these loose sandy lands, but seed supplies of neither were available commercially.

So development of a seed supply was the first job. Five acres of sand lovegrass were planted in rows at Elkhart in 1942. This planting was so successful that 160 acres were planted in 36-inch rows the following year. This field, with one cultivation a year, has produced a seed crop each of the last 5 years and has provided enough seed for planting several thousand acres of these federally owned sandy lands each year. Seed-production fields totaling about 15 acres were established at the same time at the SCS nursery at Manhattan. The seed produced by these plots, plus some seed harvested from scattered pasture areas outside the nursery, was distributed to soil conservation districts. Practical methods of planting, growing, and harvesting sand lovegrass were also developed by the nursery and the information furnished to soil conservation technicians assisting districts.

The technicians, in turn, took this information to farmers and ranchers cooperating with districts and helped the interested ones to develop seed-production fields and harvest seed. Leadership in districts to bring sand lovegrass seed into production undoubtedly goes to Hugh Richwine, district conservationist at Dodge City, Kans. He was tireless in his efforts to get farmers started on seed production and seeding of the sandy lands. Others who deserve special credit include George S. Atwood, work unit conservationist for the Morton County LU project; Tom D. Dicken, district conservationist at Pratt; and Clyde B. Dennis, work unit conservationist at Larned.

Farmers took slowly to the new crop at first, but many ranchers went to see the grass seeding on the LU area and on the grazing studies at the United States Southern Great Plains Field Station at Woodward, Okla.

As interest heightened, district boards and technicians urged farmers to plant 2- or 3-acre

Harvesting sand lovegrass with binder on the C. O. Fisher farm near Fellsburg, Kans.

This stand of sand lovegrass on the J. E. Buster farm near Larned, Kans., was planted in 30-inch rows for seed production in February 1947. Seed was harvested in 1948.

plots of sand lovegrass in rows for seed production. This did not succeed because the fields were so small that it took a farmer longer to get ready to plant, cultivate, or harvest than it did to do the job. Very little seed was harvested. By 1945 it was realized farmers must be helped to produce sand lovegrass on a field basis if the necessary seed were to be produced.

In 1945 and 1946, with seed costing $2.50 a pound, several farmers planted fields ranging in size from 5 to 50 acres. Most of these plantings were on light, hazardous, beaten-up, cropped-out, loamy sand. In 1947, with the market price of $3 per pound for the seed, many more sizable fields were planted in rows for seed production. This was on better land, some of it irrigated. In 1948 farmers paid as high as $5 per pound for seed for additional field plantings. In 1949 their efforts really began to pay off. Although there is no complete record of seed produced, reports from 16 soil-conservation districts in south central and southwest Kansas show a total of 51,926 pounds of sand lovegrass seed produced in 1948. In the Edwards County Soil Conservation District alone, 7,900 pounds were harvested.

Yields of sand lovegrass seed have varied considerably, depending on type of land. Harry Lightner, Garden City, cooperating with the Finney County Soil Conservation District, planted 25 pounds of seed on 15 acres of loose, nearly infertile sand in 1947. He controlled the weeds by mowing until mid-summer, and that fall he collected 368 pounds of seed even though a seed crop is usually not expected the first season. He used 2,4D to control weeds the second season and harvested 2,200 pounds of seed on this same field.

In contrast, Myles McGeehee, Pierceville, cooperating with the Gray County Soil Conservation District, planted sand lovegrass in 24-inch rows on bottom land with a beet drill, mixing the seed

with milo chop in order to reduce the rate of seeding. He irrigated the field once the first year and mowed once to control weeds. The second year he killed the weeds with 2,4D and irrigated the crops once. He harvested the seed with a binder and threshed with a combine, bucking the shocks to the combine. The seed yield was 3,000 pounds from 10 acres.

J. E. Buster, Larned, a cooperator with the Pawnee County Soil Conservation District, planted 33 acres of sand lovegross with a lister in 42-inch rows in February 1947, listing it shallow in volunteer rye. The covering disks were reversed and set down. This made a small furrow on each side of the bottom of the lister furrow, to prevent sand from washing it and covering up the seedlings. Actually, the seed was planted on a ridge in the bottom of the lister furrow. Buster mowed the rye the first year and in the second year gave the grass one cultivation. He swathed part of the crop and threshed it out of the window with a small combine and pick-up attachment. He harvested the rest of the crop with a grain binder and threshed from the shock. This field, along with a 33-acre field planted the previous year, produced a total of 5,800 pounds of seed.

Cooperating with the Finney County Soil Conservation District, L. L. Jones, and son, purebred Hereford breeders with 10,000 acres of sage-covered sand-hill pasture southwest of Garden City, planted 15 acres of their best irrigated land in the Arkansas River bottom to sand lovegrass. They were interested in producing seed to improve their own depleted pastures. They combined 2,000 pounds of clean seed from their field in 1948 to give them a good start on their reseeding program. They also bought a grass drill.

Wendell McMinimy, Ashland, a Clark County Soil Conservation District cooperator, planted sand lovegrass in 42-inch rows, mowed the weeds the first year and sprayed for control the second year. He said that if someone had offered him $5 an acre on his investment, he would have been tempted to sell out. But in the fall of 1948, he combine-harvested 570 pounds of sand lovegrass seed an acre from this 10-acre field for a total yield of 5,700 pounds. The soil is not very sandy, but is upland, receiving no moisture other than rain and snow which fell upon the field.

Nathan Hayse, Jr., Mullenville, cooperating with the Kiowa County Soil Conservation District, used the same system as McMinimy on 50 acres, except that in May he applied 100 pounds of ammonium nitrate per acre on most of the acreage. The nitrate made the difference between no seed and 100 pounds per acre, which is good yield on very thin sandy land.

Harry Brown, Holcomb, a Finney County Soil Conservation District cooperator, harvested 2,000 pounds of seed from a 120-acre pasture seeding made in 1947. He hadn't intended to harvest seed from that area, but spring growth in 1948 was so good that he withheld grazing, with the result that he now has a supply of seed for additional pasture seeding.

It appears the sand lovegrass seed production problem has been solved. Many farmers now know how to produce it. Although 2 to 4 pounds of seed per acre were used in some of the earlier seedings, it has been found that not more than 1 pound of good seed per acre is needed to give adequate stands in 36-inch rows.

Seed dormancy, which caused considerable late-season emergence in some of the first seedings and caused some seed lying over until the second year before germinating, has been overcome, at least in part, by planting in very early spring—as early as February 15. The theory behind early plantings is that the seed will be subjected to conditions equivalent to the soaking and prechilling which increases germination of the seed in the laboratory. Technicians have reported better stands from these early plantings than from those of mid-April or later. Since many of these fields are on infertile sands, several farmers plan to try fertilizer to increase seed yields. The application of 60 pounds of nitrogen per acre on April 15 to May 1 at the SCS nursery at Manhattan increased sand lovegrass yields from 279 to 388 pounds per acre in 1944, from 116 to 198 pounds in 1945, and from 104 to 261 pounds in 1948.

In addition to these row plantings which are providing the needed seed, ranchers and farmers are planting more and more sand lovegrass for pasture, 200 acres here, 75 acres there, several thousand acres seeded by plane. Still more seed-increase fields are being planted by farmers, who no longer need to be urged.

Regrassing this area in southwestern and south central Kansas is a tremendous task. Much of it is rolling, loose sand hills, with many pastures of a thousand acres and up that are virtually inaccessible to machinery and largely covered with sagebrush. Special grass drills and broadcast-

type seeders have been used on the Morton County LU lands, but getting over sagebrush land with this type of equipment is so difficult that the sandy lands that once were cropped have been seeded first. Most of the sagebrush land remains to be seeded. Various ways to remove or reduce the sagebrush, before seeding with a drill, have been tried. Mowing, railing, 2,4D spraying and use of a one-way plow have met some success, but ranchers generally are skeptical of this type of treatment.

Most ranchers hope airplane seeding will prove practical. The first to seed sand lovegrass by plane was Chet Reeve, cooperating with the Finney County Soil Conservation District in the seeding of 800 acres on his ranch south of Garden City in April 1947. Moisture conditions were good and he obtained good emergence, but there was a heavy grasshopper infection that year and by midsummer only a few plants could be found. They were around blow-out areas, where grasshopper populations were light. With the plentiful 1948 crop bringing the seed price down to $1 to $1.50 a pound, and with some ranchers even raising their own seed, interest in airplane seeding is growing again. Airplane seeding was tried in February 1949 by John Burnside, 640 acres; Chet Reeve, 1,200 acres; and O. C. Hicks, 1,280 acres in strips. In the Clark County Soil Conservation District, J. E. Alexander, Ashland, seeded 2,000 acres of his ranch by plane.

It may be that some method of ground planting, and perhaps some other grass species may have to be included to improve these depleted sandy range lands but, anyhow, enough seed is available for immediate demands of a grass that promises to have a very important place in regrassing this area. And the production of sand lovegrass seed has paid off in profits to the growers, in lower cost seed for farmers and ranchers to use in making sandy land into good pasture, and in eliminating potential wind-erosion hazards by getting this land into its best use, which is growing grass for livestock.

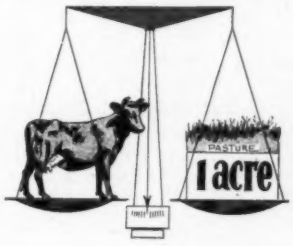
The production of sandlove and other grasses for seed has paid off in other ways, too. Farmers and ranchers are getting grass conscious. They are learning more about grasses since grass seed production aroused their interest. They are interested in having better grasses—Blackwell switchgrass, Caucasian bluestem, intermediate wheat, sand love, and others. Last spring no farmer with 100 acres or more to plant to grass suggested dilly-dallying along with planting 10 to 15 acres a year—he wanted to do it all at one time. Farmers who have land that should be in grass for pasture rarely ask today how they might keep farming it to skin-out a few more crops. The question is usually, "What kind of grass should I plant and how is the best way to do it?" Sand lovegrass seems to provide the answer for the sand-hill areas not only in southwestern and south central Kansas, but probably in adjoining States as well.

COST CAN BE COUNTED

(*Continued from page 122*)

ments to their own farms could figure out the costs. Each field and its improvements were described and the cost estimated and it was figured out just what the field would have to produce to pay the improvement cost.

The farm on which the demonstration was made covers about 135 acres. Designed to support, eventually, a herd of 30 dairy cows, a first objective is to put the land in shape to produce the feed for such a herd. Where four, five, and six acres of pasture now are needed to support one cow, the pasture land on this farm 3 years from now should be capable of supporting one cow for each acre.



PEOPLE WORKING TOGETHER

(*Continued from page 131*)

realize that the way to move to a better farm is to improve the farm you are on." I noticed that Tenant Myers nodded in agreement at this statement, and so did I.

As well as I could get it, income had increased as the result of the arrangement for operating the farm on a landlord-tenant copartnership basis, and with a thoroughgoing soil conservation program.

Mr. Cox's last observation was that when the landlord and tenant go into a partnership of this kind it will work if they are both fair, and fail if they are not.

NOTES FROM THE DISTRICTS

WATER, WATER EVERYWHERE.—Farm ponds—big ones, little ones, and hastily scooped dugouts, planned and constructed under SCS technicians' guidance, paid crop-saving irrigation dividends to many northeast farmers during last summer's drought.

In the Hampden (Mass.) Soil Conservation District, one vegetable grower overcame the emergency by pumping from his farm pond the equivalent of 1½ inches of rainfall on his fields every fifth day.

In the Allegany County (N. Y.) Soil Conservation District, Leland Kreidler, potato farmer near Canaserage, with the help of SCS technicians dug a small experimental pond at a cost of about $400. To it Kreidler hooked a pump and enough 10-foot sections of aluminum pipe to stretch across his widest field. Nozzles at every 30 feet threw water 20 to 50 feet. Twenty rows were covered at one time. Results were so satisfactory that he brought the SCS and district men back to double the capacity of the spring-fed dugout at a cost of another $400, because he needed still more water.

Solitario Brothers, Freeding Hill market gardeners in the Hampden (Mass.) Soil Conservation District, built a 100,000-gallon pond (occupying one-tenth of the surface area) in an old swamp site. Holding enough water to irrigate 4 acres every eighth day, it proved its worth during the drought.

In the Plymouth (Mass.) Soil Conservation District, Joseph Teeling, Middleboro farmer, put a new farm pond to unexpected use when drought closed in on his small fruits. He bought irrigating equipment, hooked it to the pond and pump, and saved his fruit.

The drought has given farm-pond construction its biggest impetus. In New York, another powerful influence has been the farm-pond building program launched by the State grange. This organization puts emphasis on stock and spray water, irrigation and fire-protection services, with fishing, swimming, boating, skating, and picnic centers in minor roles. In the Allegany County (N. Y.) Soil Conservation District in June 1949, a farm pond was built every day—30 completed during the month.

EQUIPMENT AT HAND.—Kenneth and Douglas Bray, GI brothers who are farmers in Flemington County, N. J., in the Mid-Jersey Soil Conservation District, are demonstrating how farmers can install major parts of their conservation farm plan with their own equipment. When normal farm operations are slack, they build diversions and terraces as rapidly as SCS technicians can establish the lines. When farm operations pick up and the Brays are needed for regular field work, they hire a contractor to finish the jobs they have started. Of their 147 tillable acres, 102 are now contoured. Since 1948 they have built 5,000 linear feet of diversions, planted 35 more acres on contour, and removed 4,000 linear feet of hedgerow that permitted them to reclaim 2 acres of good land. About half the work has been done with their own equipment. Brayacres no longer looks like the erosion-scarred farm they bought 3 years ago.

WEEK WENT WELL.—Georgia's Second Annual Soil Conservation Week last fall found more than 20,000 persons attending conservation demonstrations, meetings, and civic club programs. Almost 40,000 Georgians heard ministers deliver 385 sermons appropriate to the occasion.

The State's 25 soil conservation districts report that approximately 200 motion pictures dealing with conservation subjects were shown to 14,000 people. In on-the-farm training classes more than 10,000 veterans heard lectures on soil conservation activities.

The week received attention in 735 newspaper articles, 112 newspaper editorials, 513 newspaper advertisements, 96 radio programs, 138 farm tours, 51 exhibits, and the distribution of 5,600 placards, stickers, and bulletins.

EIGHT ACRES BROUGHT TO LIFE.—Hedrick Brothers, Holly Valley farmers in Tygart's Valley District, Tucker County, W. Va., with SCS help have converted 8 acres of abandoned land to lush pasture. Where there were only white oak sprouts and weeds, not enough vegetation to support one animal unit, 12 head of dairy cattle now feed on luscious grass.

After the 8 acres had been cleared in 1947, 24 tons of ground limestone and 2 tons of 0–20–0 fertilizer were worked into the soil by disking and harrowing before the field was seeded with a bushel of oats per acre and a mixture of redtop, orchard grass, alsike, and Ladino. When the oats were 15 inches tall, 7 dairy animals were turned in for 3 months' grazing, because there was no other pasture on the farm. In August the pasture was clipped for weed control.

In 1948 the seven dairy animals grazed there from early spring until late fall. The pasture had no additional treatment except for another August clipping. In 1949, 12 head of dairy animals grazed there. After clipping in August, 500 pounds of 3–12–6 and 200 pounds of 0–20–0 per acre were applied.

An additional half acre is getting a similar treatment and two more fields are to be handled in a comparable way.

THE FENCE IS ALIVE.—In Massachusetts, more than 80,000 multiflora rose seedlings, supplied by the United States Soil Conservation Service and the Massachusetts Department of Conservation, have been planted this year—15 miles of living fence in the making.

RHODE ISLAND PONDS.—For protection against future droughts, such as they suffered last summer, four Newport County cooperators in the Eastern Rhode Island Soil Conservation District are spending $50,000 to build farm ponds and install irrigation systems, under the guidandce of SCS technicians.

Because it requires 27,000 gallons of water to cover an acre of land with water 1 inch deep, the technicians made tha first important contribution in the farmers' conservation program by determining that a sufficient supply of water is available to justify the expenditure and effort.

A brook-fed pond at Tobias Cotta's Middle Road farm will hold 1,400,000 gallons of water and irrigate 26 acres of potatoes. The irrigating system will require 3,000 feet of drains and 1,000 feet of laterals.

At Gabriel Rego's Mitchell Lane farm, underground springs will supply the water to irrigate 50 acres of potatoes, corn, and other crops and provide water for his farm stock. The excavation will cost $1,000.

Ralph Turner is building a 1-million-gallon pond at his East Main Road farm where he will irrigate potatoes, his principal crop.

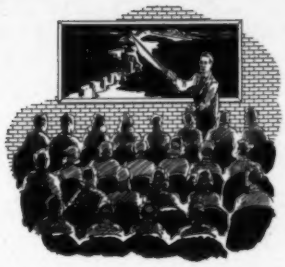
Two ponds, holding 3 million gallons, are being built at Herbert Chase's Bristol Ferry Road farm. A brook is being diverted to supply some of the water. The remainder will come from surface runoff and springs.

All of these farmers have terraces and contoured plantings, designed to hold water on their land, as part of their conservation farm plans.

POND FOR FLYING FARMERS.—When John Canne, cooperator in the Ontario County Soil Conservation District, near Phelps, N. Y., built a farm pond as part of his complete conservation farm plan, he prepared for fire protection and livestock and irrigation water and stocked it with fish. Then, remembering that he is a Flying Farmer, he had the SCS technicians design the dyke so it would be wide enough to serve as a landing strip. Next he equipped his hangar with dressing rooms, so his family and neighbors could use the pond for swimming. In August, fellow members of the New York Flying Farmers club and their families, 50 persons in all, came flying in, landed on the strip and held a Sunday outing, including a picnic dinner and a club meeting, around the pond.

DETOUR.—While scooting down New York State Highway 17, vacation bound from Iowa to New York City, G. Washington Smith misinterpreted the signals of a State policeman who was guiding traffic to a soil and water conservation field day at Apalachin, near Owego, N. Y., and entered one of the narrow dust-heavy country roads leading to the operations. He thought it must be a detour.

A mile or so up the hill, he discovered his error. Like some 40,000 other people, he landed in a parking lot where everyone was arriving and no one was leaving. Several hours later, when the rush eased, Smith and family maneuvered their car out of the lot, back down the hill, and again headed for "Big Town." Commented Smith, "We're powerfully strong for soil conservation out in Iowa, but this beats anything I've ever seen."



EVERY PUPIL REACHED.—Soil conservation has been included in *every* course of study in *all* the grades of the 25 schools of the Waco, Tex., public school system this year.

Irby C. Carruth, superintendent of the Waco schools, with conservation material furnished by T. O. Pridgeon, district conservationist, has prepared a teaching guide for all the grades in his school. This guide makes it possible for teachers of all courses to inform students as to the seriousness of erosion and the urgent need for a coordinated conservation program. For example, the mathematics courses have problems pertaining to erosion and conservation; the art courses depict forcefully the results of erosion and the conservation practices so necessary for a permanent agriculture.

Field trips are arranged to study conservation practices applied on farms of the McLennan County Soil Conservation District cooperators. Students are gaining information about the organization and operations of their local district. The board of supervisors has encouraged Superintendent Carruth to continue his aggressive interest in conservation, and are hopeful that other schools in the district will be inspired to follow the example set by Waco.

OUT WHERE THE DEER ROAM.—Deer hunters in the vicinity of Tooele, Utah, were enlisted in range reseeding work this fall, according to Orville Mooberry, president of the Tooele Wildlife Federation.

Boy Scouts and members of the federation prepared 1,500 bags containing a mixture of five varieties of hardy grass seed. These bags were made available to hunters at hardware and sporting goods stores and at checking stations.

Harry K. Woodward, representing the Soil Conservation Service, furnished seed and detailed instructions for planting. Each bag contained enough seed to plant 40 square feet.

Seed enclosed in the bags included crested wheat, yellow sweetclover, bulbous bluegrass, smooth brome and Indian ricegrass. These will grow with as little moisture as any other grasses, and are good range plants.

The plan is designed to help improve the range, and will help to keep the deer in good shape and assure good hunting in future years.

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30 MILES PER HOUR.—Frank Coles, conservation farmer at Deerfield, southern New Jersey, says he can drive his car over any field on his farm at 30 miles per hour without being uncomfortable. A few years back,

before he put his complete conservation farm plan to work, he couldn't cross gullies on 50 percent of his land with a tractor in low gear. Six or eight years ago, when Coles had straight-row crops, his farm was washing away during every rainstorm. Now, with contour cultivation, diversion terraces, and all the other practices that go with conservation farming, he can set up a nozzle on every 20-foot section of irrigation pipe and evenly distribute—and hold—twice the amount of water needed for straight-row farming.

GREEN CARPET FOR INDUSTRY.—Fescue lawns grace 80 acres of a large copper plant at Decatur, Ala.

Last fall, P. W. Robson, a former SCS employee and now engineer for the local plant, asked advice on erosion control. Of course, he wanted not only to stabilize the soil but also to beautify land not covered by buildings and streets.

It was decided that Suiter's grass (Kentucky 31) would best satisfy the need. It was rather late for fall seeding, but Robson decided to increase the rate of seeding and fertilizing and go ahead with the improvement.

About 800 pounds of 6–8–4 fertilizer and 50 pounds of fescue seed were used on each acre. A thorough seedbed was prepared, and everyone hoped the young fescue would pull through the winter in good shape.

Now, both buildings and grounds present a pleasing appearance to all who pass or work there. And thousands of people of the Northwest Alabama Soil Conservation District will be able to observe the growth habits and soil-holding qualities of the fescue.

DRAINAGE PROBLEM.—Water can be one of man's best friends or one of his worst foes, is the conclusion of Arthur Osland near Mayville, N. Dak., in the Northeast Traill County Soil Conservation District. He now is able to seed the south half of his 640-acre farm at the right time and with confidence that water won't ruin his crop later in the season.

This is because of the drainage system he partly completed in 1946.

"It's not just spring flooding that causes the trouble," Osland explained. "Nearly every year heavy rains come while crops are growing. Excess water from those rains, standing on the land for a few days too long, is enough to damage the crops and often ruin them."

Osland's farm is in the nearly level Red River Valley, from which snow water leaves slowly in spring and over which runoff from the uplands flows. The south half of the farm is flooded every spring, even during the drier years.

A legal drain passes the farm, but water could not reach it from his land until the farm drainage system was laid out and built.

Soil improvement and a good crop rotation hinge on successful drainage, Osland points out, because a variety of crops cannot be grown unless the land is ready for seeding at the proper time.

"There are very few years that we don't get at least one heavy rain in summer. The excess water from such rains has to be removed before it drowns out the crop. The drainage system has done well both in spring and during the growing season in getting rid of the excess water."

Fescue sod makes an excellent carpet for the buildings of this large copper plant in Alabama.

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